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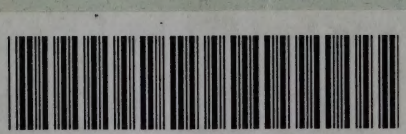
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ETIOLOGY OF DOUBLE QUOTIDIAN FEVER WITH SOME NOTES ON THE EARLY STAGE OF LEISHMAN-DONOVAN INFECTION.*

By GOPAL CH. CHATTERJEE, M.B,

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By double quotidian fever is meant the fever characterized by two rigors taking place within 24 hours with two rises of temperature, there being a period of complete apyrexia between the two onsets, and this occurring not for one or two days as accidents in the course of other diseases, but as a distinct disease occurring suddenly in perfectly healthy persons uncomplicated with other diseases. The disease as such is not common, but still enough cases of this disease occur which, on account of its peculiar distinctive features, strictly regular periodicity of the double rise of temperature uninfluenced by quinine, its long course, and invariable fatal termination, ought to be ranked as a distinct disease.

* Paper read before the Medical Section of the Asiatic Society, April 1909.

It is, however, strange that no mention of it is found in any of the treatises dealing with Indian fevers.

Fayrer in his exhaustive book on the then known Indian fevers does not mention it.

Manson in his treatise on tropical diseases mentions a quotidian type of fever caused by unpigmented parasites, but does not mention the double quotidian.

Major Rogers in his treatise on Indian fever mentions that in some cases of early Kala azar there is often a history of double rigors occurring in the course of 24 hours for some days as being remembered by the patients.

That this disease is not a recent arrival is proved by the fact that it is a disease well known to the old practitioners of Lower Bengal, who very much dread it on account of its invariable fatal termination; besides, the disease has been described in the well-known Sanskrit treatise *Susrutha* (32nd *Slokas*), as a *Bisama Jwar* (Grave fever).

In the course of the last five years, I came across 10 cases of this disease; the common peculiarities of these cases are that the persons attacked had been before the onset of the disease perfectly healthy, and with one exception, they are all residents of Calcutta.

1*st case.*—Hindoo male, aged 16, resident of Calcutta, for four years, before the onset of the disease, got a sudden attack of high fever with severe ague at about 9 A.M. in the morning, the fever lasted for about 9 hours, temperature rising to 105·6° followed by another attack of fever of the same type, 3 hours after complete cessation of the first fever.

This went on regularly for over 18 months with slight occasional breaks, during which

the fever became continued for a few days after which it assumed its old type again. Quinine did not influence the fever in the least, and when excessive doses were tried, the patient became prostrated and there was a slight irregularity in the course of the fever. The patient, when not taking quinine, would go about freely during the time of intermission, and even after several months' illness, was not much prostrated. Examination of blood made 6 times during the whole course of the disease, showed no parasite, nor any abnormality in the count of the leucocytes, except during the last stage of the disease when there was found distinct leukopænia and relative increase of large mononuclear.

For one year, the fever continued without showing any complications. Lungs were repeatedly examined, no noticeable change was detected. Spleen and liver showed no enlargement. At about the end of a year, the spleen became enlarged, and after six months it reached beyond the navel. A patch of dulness was found in the left base of the lung, due probably to thickened pleura.

After 18 months' continual suffering the patient died of general marasmus, swelling of the feet and some heart trouble. Only for a few days before his death, the double quotidian type was replaced by low continued type.

2*nd case.*—A sister of the above case, aged about 16, had an exactly similar course, lasting over a year. In the last stage, enlargement of spleen and liver without any lung mischief and general dropsy set in. The blood examined several times during the course of the fever, gave similar negative results.

I may mention in this connection that a boy, aged 24, brother of the above two, a year after the death of the 2nd case, suffered from regular Kala azar fever and died of it. Another brother had also the same disease, and the fever is going on for over a year.

3rd case.—The patient, a female, aged 20, living in Jubbulpur, got a sudden attack of double quotidian fever. Previous to the onset of this fever, she had been perfectly healthy. After a month's illness, she was brought down to Calcutta. The blood was repeatedly examined without showing any parasites.

In this case an alarming symptom was present. At the time when the temperature used to come down, there was profuse perspiration, temperature sinking down to 95·6 with all signs of collapse. After an illness of three months, during which the periodicity of the fever showed no change even for a single day, she died suddenly of collapse, without any complication setting in.

4th case.—An adult, aged 40, an inhabitant of Calcutta, started getting double quotidian fever. During the period of pyrexia, he used to become depressed, as in the last case. I heard that the patient died nine months after with enlarged spleen and general anasarca.

5th case.—An adult, aged 35, Hindoo male, an inhabitant of Calcutta. In this case, the temperature used to shoot up to 107°, when he used to become unconscious; there was albumen in the urine. Died a year after, the spleen being greatly enlarged at the time of death.

6th case.—A Hindoo male, aged 30, used to live occasionally in a mofussil station, in a malarial district, and had some attacks of malarial

fever, previous to this. He suffered from double quotidian fever for over nine months, and died with enlarged liver and spleen, the spleen filling up the whole of the abdomen.

Several times the blood was examined, no parasites found, but there was distinct relative leukopænia, the white corpuscles numbering five hundred per c.mm. and the red corpuscles numbering 2½ millions. The spleen was punctured in this disease and any number of Leishman-Donovan bodies found.

7th case.—An inhabitant of Calcutta, aged 40, Hindoo male, had a similar course as the above. Blood was examined, showed no parasites. Died after one year's illness.

8th, 9th and 10th cases are similar to the last two cases. The blood was examined in all of them with negative results. The disease lasting for about a year, the patients at death having enlarged spleens and livers.

From the accounts of the above cases, it may be gathered that this double quotidian fever is nothing but the early stage of Leishman infection, as it has been confirmed by the finding of the parasites in one case, and by the fact that in the family of first two cases which occurred in the same family, two cases of typical Leishman infection were found. In these two cases, the fever was of a continued type, resisting treatment by quinine for over six months, before the enlargement of spleen and other signs of Leishman infection showed themselves. Indeed, it is strange that in studying the early stages of Kala azar, no single type of fever or a similar beginning was found in a large number of cases; one case differs from the others in many points; that it is difficult to diagnose the cases in the

beginning, as it simulates other fevers like typhoid, etc. A series of types of fever in the early stage has been described in Major Rogers' book on Indian fevers. In this he mentions seven types of fever, namely : (1) High continued fever ; (2) Double remittent fever ; (3) High remittent fever ; (4) Low remittent ; (5) Low continued ; (6) High intermittent; (7) Low intermittent fever; and he mentions double remittent or double continued type of fever as the characteristic of Kala azar.

It appears, however, that even these seven types of early beginnings of Kala azar are not exhaustive enough, as the double quotidian type of fever is also the beginning of some of the cases, as has been described above. Besides several cases begin as true malaria with parasites and having slight enlargement of spleen, and then after a time Leishman-Donovan infection sets in and this type forms a large percentage of the cases. As both diseases produce enlargement of spleen and similar symptoms, it is very difficult to differentiate them. In one instance I drew out blood after puncturing the spleen of two sisters living in the same house having enlargement of the spleen similar in appearance, the enlargement not reaching down to the umbilicus, one showing numerous Leishman-Donovan bodies and the other numerous crescents.

In another case of enlargement of the spleen reaching below the umbilicus, I found by puncture innumerable quartan parasites. Indeed, it is strange that the two diseases which in their distribution occupy the same area and affect the same kind of people and produce similar pathological changes in the system, are not found together in the same patient at the same time,

as up to now not a single case of such double infection has been reported. This is not due to want of observation for this particular fact; for the examination of the spleen for Leishman-Donovan bodies which are being conducted in innumerable cases by numerous observers would have shown the malaria parasites if they are present in the same slide in which Leishman-Donovan parasites are found as the methods of staining and examination are similar in both cases, the malarial parasites being more likely to be found in spleen blood than in the peripheral blood.

In a family living near Calcutta two cases of high fever coming every day with ague came under my observation from the very beginning; in one I found numerous rings of malignant tertian parasites, in the other no parasites were found. The first case was cured within a few days by quinine; the second is still continuing for more than three months, showing all the characteristics of Leishman infection, enlargement of spleen and characteristic blood change, quinine having no effect on the course of the disease.

In another instance, in a family, three cases of typical Leishman infection occurred with fatal terminations and one of black-water fever with similar termination, the whole family being literally wiped out. In two of the first cases the beginning was like ordinary malarial fever (quotidian type), and in both malarial parasites were found; in one benign tertian and in the other malignant tertian parasites. After several relapses the type of fever changed to low remittent type of fever, which could not be influenced by quinine. These two cases are typical instances of Leishman infection following malarial infection.

That this sequence of events is very common is proved by the fact that in the examination of spleen smears of all cases dying of suspected Leishman infection in the Medical College Hospital during the last 4 years, I found in most cases in which the Leishman-Donovan bodies were found, as a rule, malarial pigment.

Though there are countries like Italy in which malaria prevails in an epidemic form where Leishman-Donovan bodies have not yet been found, yet these must be rare instances of its kind—the two diseases (malaria and Leishman infection) are, as a rule, found in the same locality. In Algeria even after the discovery of Leishman-Donovan parasite, descriptions of malarial cachectic cases are given with huge spleen protruding out of the abdomen, as being due to malaria. Only recently the observers there have started finding Leishman parasites.*

The following points require elucidation in view of the above facts :—

(1) What is the relation between the malarial parasites and Leishman-Donovan parasites ?

(2) How is it the two parasites are not found together in the same body at the same time ; even if found, why is it so rare ?

(3) Is there any such thing as true malarial cachexia ?

(4) If so, what is the difference between it and the cachexia produced by Leishman bodies ?

(5) Whether large numbers of cases of Leishman-Donovan infections are not sequelæ of true malarial infection ?

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* An observer has described very recently typical cases of Leishman infection in Sicily, which have been confirmed by spleen puncture.

(6) What proportion of cases of Kala azar begin as such and not follow malarial infection ?

Elucidation of these problems will be of great help to those Sanitary Officers who have to deal with malaria and Kala azar epidemics. They know how to deal with malaria in the light of recent discoveries, but are powerless against the Leishman infection.

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